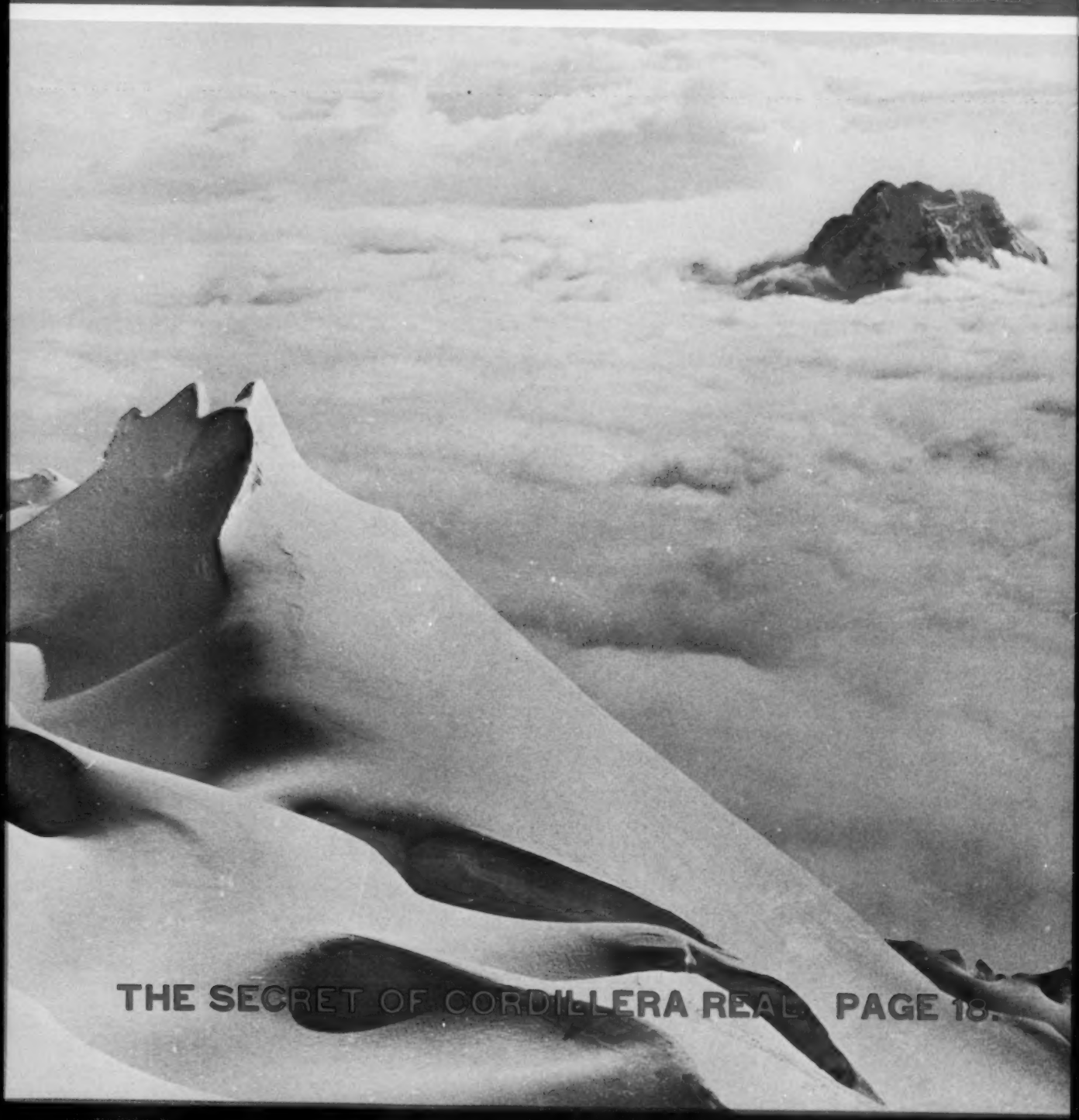
The MAC Flyer

MARCH 1975



THE SECRET OF CORDILLERA REAL PAGE 18.

MILITARY AIRLIFT COMMAND

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The MAC Flyer

For Greater Efficiency
in MAC Air Operations

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Cover: Remote areas of the world present hazards to global airlift. Cloud cover, in this photograph, masks the jagged terrain in one of the more primitive areas frequently overflown by transports.

The MAC Flyer is published by the Directorate of Safety, HQ MAC. The contents are informative and not regulatory or directive. All names in accident stories are fictitious and no information concerning aircraft accidents may be construed as incriminating under Article 31, UCMJ.

Contributions, comments, and criticisms are welcome. Write: The Editor, The MAC Flyer, MAC/IGFE, Scott AFB, IL 62225, or call: (618) 256-3534, Autovan 638-3534. The Editor reserves the right to change manuscripts to improve them or correct technical errors.

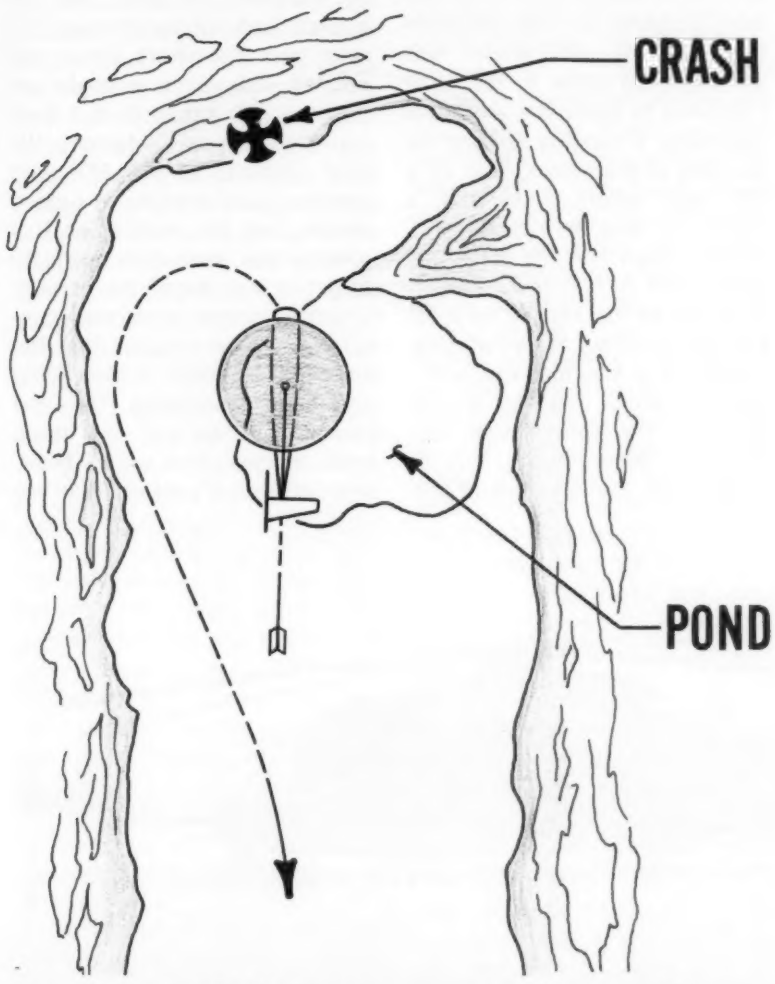
The magazine is available from: The Superintendent of Documents, Government Printing Office, Washington, DC 20402. Price 70 cents per copy, $7.90 per year ($9.90 foreign).

Distribution F, X; OPR MAC/IGFE.

A Closing Lid on the Box Canyon

Here's what happened to one Jolly Green crew that found itself against a wall with no place to go.

by Capt David H. Wammer
1550 ATTW
Hill AFB, Utah



The pilot departed for the crash site, unaware of what awaited him.

A light aircraft was down in the nearby mountains of Colorado.

We launched our H-53 out of Longmont, and headed for the crash site located some 11,200 feet MSL at the closed end of a box canyon.

When we arrived at the scene, around 1600 local time, one of the first things we noticed was the sheer cliff, rising 1,200 feet above the canyon floor. An overcast at the top of the wall created an illusion, making the terrain features in the canyon below seem flat and dull.

It was cold and below us six inches of powdered snow blanketed the canyon floor. At the end of the canyon, near the sheer cliffs, was a frozen pond. I was glad that the air was cold; it would give us more power. We had computed the power requirements at 86 percent. Power available was computed at 95 percent, more than enough to hover out of ground effect (OGE).

We started up the canyon at 300 feet and 35 knots. About a mile from the canyon wall I started a shallow approach, descending at 200 feet per minute and hoping to find a suitable landing spot at the bottom. If I couldn't find a place to land, I would hover high enough to avoid the blowing snow that the rotors would kick up. From that point I'd lower the PJs down the hoist.

The plan seemed good enough

until we were halfway through the approach. Suddenly, I realized that I had full power pulled in. The collective was all the way up and we were still descending at 200 feet per minute.

It was time for a drastic change of plan — this time to save our own skins. My thinking speeded up — push the nose over, get more airspeed, climb out! But that wouldn't work because the canyon walls were too high! Now what? Look for a landing spot for the inevitable approach to a touchdown! But where? The only place I could think of was the pond at the very end of the canyon. It was frozen solid and surely would support our weight. But it was smooth ice! An approach to touchdown on that hunk of glass would turn our 30,000-pound helicopter into an oversized ice skate skimming across an ice rink to a guaranteed meeting with the canyon wall!

There was one other option — a quick one-eighty and back out of the canyon the way I had come. By this time we were so low that the powdered snow was swirling around us and we were about to go IFR. I looked down at the altimeter again and we were just 75 feet above the snow. Banking hard left, I kicked full left rudder. I know, left turns rob power, but the canyon was narrow and the cliff was coming up fast.

I had no sooner started the turn when the blowing snow enveloped the helicopter in a white bubble. I couldn't see anything outside and was trying to figure out how far I had turned and the direction of the canyon wall. Suddenly the wall appeared at two o'clock and I knew I was too close. So close, in fact, that I decided to lower the collective and make a running landing on the side of the canyon wall as a last ditch effort at survival. I turned as hard as I could and, when I rolled out, the rotor tips were within 20 feet of the canyon floor. But we had missed the cliff! The ground effect at that altitude alowed us to stay airborne, and I have no doubt that the ground effect off the canyon wall prevented us from crashing into it.

We made our way out of the canyon and the rest of the trip out was uneventful and very quiet. But what had happened? Were the engines sick? Had we miscalculated our performance data? Had there been a tailwind, a downdraft? Was it poor judgment on my part, committing my crew and aircraft under the conditions?

Later, the numbers were recomputed. They were correct. The engines were checked before and after the run-in and were performing properly. There had been no indication of wind, and the aircraft had not handled as if it were in a downdraft. There was not the turbulence normally associated with a downdraft. I don't feel I used poor judgment. We train students at Hill AFB with smaller power margins in rugged terrain, and the weather on this mission was more than adequate to get in and out of the canyon.

Other factors were also considered. It was possible that the air mass in which I was flying was also descending. Did you know a downdraft of only three knots equals about a 200 f.p.m. descent? And it's insidious — my

Back at the base a weight recheck revealed some startling facts.

vertical velocity indicator showed 200 f.p.m. in the air mass, and if the air mass is also descending at that rate, you'll never know that you're going down at 400 f.p.m. — but the aircraft will, when it comes time to try and stop it! Also, there's no turbulence with this type of downdraft. Much of our performance data for high altitude is really a projection of the low altitude data. This is true for the H-53, and I'm sure for most other helicopters as well, so I thought perhaps that was the problem. Another factor is that maybe power reserves don't work the same way at altitude — in this case 10,000 feet density altitude. If at sea level it takes one percent more torque than OGE power to stop the momentum of a descending helicopter to establish an OGE hover, and it takes five percent at 5,000 feet, does it take nine percent at 10,000 feet? Perhaps it takes 15 or even 20 percent! There's no data available, so I don't know. I have been told that the Army performed tests to support projected data for high altitude autorotations. In the first autorotation attempt, the helicopter rolled up in a ball! Here's another probability: translational lift occurs at a much higher true airspeed, or apparent ground speed, at 10,000 feet density altitude than at sea level. Any of these reasons could have caused my problem in the canyon, and it was an eye opener that so many uncalculated performance gremlins are still floating around, waiting for an unsuspecting aircrew.

With all of these different factors, what happened in the box canyon was still only conjecture. The most probable cause still seemed to be the downdraft air mass. The real reason, however, was something that our postflight brainstorming never even considered.

About a week after the canyon incident, I happened to fly the same aircraft on a routine training mission. On initial hover, the helicopter was taking five percent more torque than normal, but the power was still within performance limits. In a ten-foot hover the H-53 usually takes about five percent less torque than the charts indicate. This margin increases in a good headwind which, in this particular case, was 15 knots. My flight mechanic commented that, compared to our other H-53s, the basic weight seemed light on this bird. After the flight, we worked the numbers for the conditions I had encountered the week before, but added 1,200 pounds to the weight just to see what effect it would have on the performance data. The computed figures showed I still had 95 percent torque available since this doesn't change with gross weight, but 99 percent was required to hover OGE. That was good enough for me. I requested a weight check on the helicopter. The result — we found that the helicopter was 1,591 pounds heavier than the records indicated. So, on my canyon mission, instead of an eight percent reserve, I had a six percent deficit! Luckily, the weight error was found before someone else got caught behind the power curve.

I might add that the helicopter was relatively new on station, and no one, including myself, had noticed that it didn't have the normal power margin characteristic of an H-53 or that the basic weight seemed unusually low. After all, it was within specs! Sometimes, when things don't seem right but we can't put our finger on the cause, we let our suspicions slide by. It would be small consolation and a poor epitaph that read "But it was within specs!"

Embarrassing and scary as it was, I think the close call in Colorado was a worthwhile experience because of the questions that were raised in brainstorming the cause for my near melding of helicopter and rock canyon wall. It also made us aware of how little we know about high altitude helicopter flying.

It's your turn now. Think about the questions I've raised and how ole Murphy almost got to me. I'm sure you'll come up with some questions of your own, and maybe because of this, when it's your turn in the "box," the lid won't close.

ABOUT THE AUTHOR

Capt Wammer was commissioned through AFROTC and entered UPT in November, 1965. He flew KC-135s for three years and later converted to H-53s for duty in Southeast Asia. He is an H-53 flight examiner pilot with the 1550 ATTW, Hill AFB, Utah, and has 2,600 flying hours with over 1,300 hours in choppers.

Hypertensi

What causes it — and how to avoid it.

by Maj Lowell A. Schuknecht
MAC/SGPA
Scott AFB, Ill.

on and You

What disease is reaching "epidemic" proportions in the United States? What disease increases your risk of having a heart attack or of having a stroke? With what disease can you be "sick" and not even know it? With what disease can up to 90 percent of its patients be treated with a combination of diet, physical conditioning, and medication? If your answer to these questions was hypertension, you are well on your way to understanding one of the more insidious diseases of modern man.

Flight surgeons are seeing an increase in high blood pressure problems during annual flight physicals. To help you prevent hypertension, here is a list and descriptions of some causes. If you have high blood pressure already, this may help you to reduce or eliminate your problems before it becomes irreversible. Some of the causes are nervousness, obesity, poor physical condition, excess salt use, peripheral vascular disease, and heart disease.

First on the list is nervousness. Any stress, physical or mental, can cause hypertension. In most cases this is a normal (and desirable) response. But continuing stress can lead to persistently elevated blood pressure. Sure, your job is stressful! But take time to relax your mind and body. If you can't ease up on the job, then find ways to relax after the job is done. Some people say they become extremely nervous while taking a physical examination. For an experienced aircrew member who is accustomed to stressful situations (and numerous physical examinations), this is unlikely. In any event, an average of several blood pressure values (usually determined over five days) will reveal whether or not the problem is due to nervousness. If it is not, and the average pressure remains elevated, a search for other causes is made.

A second cause of high blood pressure is obesity, or excess fat. Excess fat levies an extra workload on the heart because blood has to be pumped through this fat. Every pound of extra fat adds about one mile of blood vessels; these take pressure away from the essential blood vessels to the brain, muscles, and other important organs. To compensate for this pressure loss, the heart has to work harder and the total blood pressure must increase.

Blood pressure can sometimes be reduced by weight loss alone. For those of you with excess fat, a weight loss of one pound per week would be a useful goal. Generally, any diet which produces weight loss at this rate is safe. Do you have excess fat and a normal blood pressure? Why not give your heart a break and lose the weight anyway?

A third cause of high blood pressure is poor physical conditioning. The unconditioned body normally has a limited number of essential blood vessels that it uses. Remember, blood vessels through fat are not essential — they only serve to make the heart work harder and to make the blood pressure go higher. The essential vessels represent a certain resistance to the pumping of the heart and thus account for a certain blood pressure for the body. In the unconditioned body, however, many other potential blood pathways may be activated to provide better oxygenation to essential tissues and produce a lower blood pressure in times of stress.

Physical conditioning accomplishes several things. It opens these potential blood pathways, thus lowering the resistance to the pumping of the heart. It increases flexibility of the blood vessels which also lowers the resistance to the heart. And it decreases the heart rate during stress, thus helping maintain blood pressure within a more normal range during stress. Any regular exercise program is useful. Jogging and swimming are among the best activities if performed regularly.

Another cause of hypertension is excessive salt intake. Sodium in the blood causes fluid to be retained and too much sodium causes the retention of excessive

Hypertension

fluid. As a result, blood volume increases. This, in turn, produces elevated blood pressure. What is the origin of this excess sodium? Usually, overuse of table salt. But don't be alarmed! Most people with normal health have no problem handling an excessive salt load — of amost any size! But there are certain people who should reduce their salt intake, and this includes people who have hypertension.

Well, you may think, if reducing my salt load is good, then eliminating salt is better! Not so! Your body needs salt to function properly. Besides, most foods contain small amounts of salt, so don't try to eliminate salt from your diet. Instead, decrease your consumption of cured and pickled meats (bacon, ham, sausage), olives and pickles, tomato juice, cheese, salted peanuts, potato and corn chips, and that "extra" shake of the shaker.

A fourth cause of hypertension is peripheral vascular disease. Sounds intimidating, right? Actually, this cause is well known by all of you! You've heard of "hardening of the arteries," a term for a condition of the blood vessels. In essence, the artery walls become thickened, with a resultant decrease in the internal diameter, an effect much like that caused by water deposits on metal pipes. This causes increased resistance to the pumping action of the heart, resulting in increased blood pressure.

High cholesterol and triglyceride levels in the blood stream are intimately related to this cause of hypertension. In its early stages this process can be reversed by a cholesterol-lowering diet. Notice, I didn't say a "weight-reducing diet!" Obese people commonly have high cholesterol levels, but so do many normal weight people. So, a simple weight reducing diet is not enough. Proper instruction in preparing a cholesterol-lowering diet is beyond the scope of this article, but if I've stimulated your interest, then ask your physician to advise you on a diet or refer you to the dietician.

The last cause of hypertension that I will discuss is heart disease. So far, you've learned that several causes of high blood pressure (nervousness, obesity, poor physical condition, excess salt use, and peripheral vascular disease) can be corrected — at least partially — by the individual. Sometimes it takes correction of a combination of these causes. And, sometimes, correction is still not enough to overcome the problem. Perhaps the problem went unrecognized or was ignored for too long. In any event, if high blood pressure does not respond to weight loss, physical conditioning, and salt restriction, then a search for other causes must be made. In such cases the physician will evaluate the heart, kidneys, and other organ systems that could be causing the problem. Most of these cases can be treated with long term medications. For you fliers, I would point out that there are medications which may control high blood pressure and not be disqualifying for flying duties if a waiver is obtained. If such medications do not control high blood pressure, then stronger ones, not approved for flying, must be used.

ABOUT THE AUTHOR

Dr. Schuknecht graduated from the Air Force Academy in 1965 and the University of Colorado School of Medicine in 1969. After completing internship at David Grant Medical Center, Travis AFB, Calif., in 1970, he became Chief of Aerospace Medicine at Hill AFB, Utah. He entered residency training in aerospace medicine in 1972 and joined the Command Surgeon's Office at MAC headquarters in 1974.

Global Notes

super safety

Twenty-first Air Force received USAF's General Thomas P. Gerrity Logistics Award for "superior logistics support of the Air Force mission in fiscal year 1974."

The award recognized the organization's outstanding logistics performance, particularly during Operation Nickel Grass, the massive aerial resupply effort in the Middle East during the fall of 1973. C-5 and C-141 aircraft moved more than 22,400 tons of cargo to Israel in 566 missions covering a route of more than 6,000 miles one way. MAC's 21st Air Force directed the airlift from its headquarters at McGuire AFB, N. J.

And the aircrews who flew this mammoth airlift did so with a zero accident record. That's hard to beat!

now, that's class

The pilots of two historic MAC flights joined the company of such esteemed aviators as Charles A. Lindbergh, Amelia Earhart, and Max Conrad, when they were chosen to receive the coveted Harmon International Aviation Trophy. They are:

Lt Col Edgar L. Allison, Jr. (USAF, Ret) of Fort Walton Beach, Fla., who was named the winner of the 1973 Harmon Aviator Category, and **Col Edward J. Nash,** commander of 62 MAW, McChord AFB, Wash., selected as the winner of the 1974 Harmon Aviator Category.

Colonel Allison piloted an HC-130 Hercules of the 57 ARRS on a nonstop flight from Ching Chaun Kang AB, Taiwan, to Scott AFB, Ill., on 20 February 1972. The total distance of 8,732 miles was flown without refueling and established a record for the longest flight in a straight line without landing by turboprop aircraft.

Colonel Nash served both as mission pilot and prime airlift director during Operation Nickel Grass. He personally piloted a 13,000-mile C-5 mission from the United States to Lod Airport, Tel Aviv, Israel, and return, and from 14 October to 14 November 1973 directed the operations of 150 C-5 and 417 C-141 missions from the United States through Lajes AB, Azores, to the Middle East.

15,000 hours

Congratulations to **MSgt Henry P. Galdrige,** 20 MAS, Charleston AFB, S.C., for attaining 15,000 safe flying hours. This achievement was recognized in a letter from General Carlton to Sergeant Galdrige. The accomplishment identifies him as part of that one percent of MAC aircrew members who have attained this level of accident-free flying time.

extra tender loving care

Women seldom are in a position to appear on this page as safety award winners, so we are especially glad to recount a story of fast thinking by a flight nurse, **1st Lt Linda L. Carneal,** 73 AAS

(Associate), Scott AFB, Ill. During an aeromed evac flight, a litter patient in the special care area was receiving assistance changing position from her side to back when the canvas litter began rapidly tearing down the middle. Lieutenant Carneal positioned herself under the litter, bracing her back against its underside. The patient was then assisted to a sitting position and removed from the litter. Lieutenant Carneal's quick reaction prevented injury to her patient and earned for her the 375 AAW Commander's Safety Award.

An experienced airline captain tells how to ensure flights are professional—and safe.

Pilot Flight Techniques

The following article was part of a presentation at the Flight Safety Foundation's 19th Annual Corporate Aircraft Safety Seminar, 31 March-2 April 1974, and reprinted in Flight Safety Facts and Analysis, April 1974. The techniques are one man's opinion; THE MAC FLYER neither recommends nor rejects them, but offers them as points of discussion. If they apply to your aircraft but you choose not to use them, you should still find the discussion helpful by comparison.

Some years ago, a few minutes in your seat prior to taxi-out were adequate for completing the cockpit routine — a quick check for fuel, oil, emergency equipment, and Navaids and you were almost ready to go. Taxi clearance came before airways clearance and there was plenty of time during engine runup for a quick look at how you'd been routed. Those days are gone forever. With the ATIS being broadcast continuously, pre-clearance before taxi, and complicated navigational and communications requirements for SIDs, it's not possible to get organized in less than 30 minutes.

Lacking other traffic, today's jet airplane can leave the ramp, follow the taxi route, take position on the runway, and proceed through the takeoff roll without so much as a moment of hesitation. This compels us to be better organized much earlier in the flight. As soon as the runway for departure is known, the flight director (FD) should be set on the runway heading and the function selector to "Heading Select." Vernier adjustment to "center the needle" can be accomplished when aligned with the runway. The altitude warning should be set at the gate, along with the altimeters, when the airways clearance is copied.

The fact that jet engines have fuel controllers instead of carburetors should not encourage abuse of throttles. Smooth, even power application is still the sign of the professional. Icing characteristics of jet engines, however, increase the need for caution. Any time the temperature is 46 degrees fahrenheit (+8°C) or less

The sequence of events have altered considerably since this plane was new.

by Captain Mel Volz, United Airlines

and visible moisture is present, engine anti-ice should be used. A reported visibility of one-half mile or less can be considered visible moisture. If ground time is more than a few minutes, engines should be run up to insure adequate heat for anti-ice and to check that ice has not already formed. If you've never had severe turbine stalls just after liftoff as the engines start to ingest the melting ice, you've got a thrilling experience in store.

With a severe crosswind, it might be necessary to advance the throttles halfway and wait for some acceleration before completing throttle application. This allows the relative wind to move around in front of the downwind engine, or any engine with a long inlet, and prevents turbine stall.

As the airplane accelerates, airspeed indications will be normal. As the airplane is rotated to takeoff attitude, however, things are not normal. In a prop airplane, you came off the ground as soon as rotation was begun — not so in a jet. In a B-727 at five degrees takeoff flaps, for example, the airplane will rotate through more than 10 degrees before liftoff begins. This means the relative wind will change on both the pitot tubes and static vents. The relative wind remains parallel to the surface of the runway but the airplane changes pitch. As the plane begins to fly, the relative wind moves around where it belongs. In the interim, the airspeed indicator shows a complete lack of acceleration or, in some cases, a momentary deceleration.

Crew coordination is always necessary, but never more so than just after liftoff in minimum weather. Attitude is the first requisite, followed by a fast cross-check of airspeed, altimeter, and rate of climb. Since so much reliance is placed on the attitude indicator, it is imperative that the copilot do a cross-check of both sets of instruments at this crucial point in the flight to detect any discrepancies.

Aborts, or attempted aborts, make interesting reading. The important thing for the pilot to remember is that the computed speeds for his airplane were derived through demonstrations with new brakes, new tires, and a test pilot at the controls who knew he was going to abort. The cushion then applied to the actual demonstrated capability would permit the average pilot to successfully stop if the decision were made exactly at the maximum airspeed and the runway were dry. With a wet or slippery runway, we have a horse of a completely different color. Luckily, the pilot has a few things going for him. Rarely is his aircraft weight such that the runway is an exact fit. Further, aborts are demonstrated without reversing, so that's a plus in his favor.

The Descent

Let me speak about the descent and landing phases of flight. With the fuel situation we have today, it is more than ever important to maintain altitude as long as possible. The optimum descent would be with throttles closed all the way from "end of cruise" to touchdown. But in most jets today, any altitude above 30,000 feet would dictate start of descent earlier than optimum in order to comfortably get the cabin repressurized.

If anti-icing will be needed, it is essential that it be turned on early in the descent to get things warmed up. With closed throttles in the lower levels, little heating is available when it's most needed. The alternative is to extend spoilers or the gear and increase power, but this also increases fuel flow and can frequently be avoided by careful preplanning. Due to the high descent rates of today's modern jet aircraft, altitude callouts are essential.

It is especially essential with today's multiple ILS airports and parallel approaches that a careful check of the plate page be made to insure that the proper frequency is selected when tuning the ILS for final approach. A good technique is to call out the frequency and have the other pilot verify it along with the proper identifier. Then both should listen to the ident to be sure that the proper ILS is, in fact, tuned. Then a cross-check of the proper inbound heading, intercept altitude, and most important, the proper glide slope altitude at the outer

Flight Techniques

marker. This altitude should be called out at marker crossing to verify that the true glide slope is indeed captured and not an upper or lower reflection.

A new ILS procedure is being introduced. This is a back-course approach with a glide slope. This can be a real fooler and requires very careful cross-checking. As you all know, some back courses do not give a glide slope flag when inbound, some give a centered glide slope indication at all times, and some fluctuate in a normal fashion. Most, if not all, of the back-course approaches with a functioning glide slope have a simple switch in the tower; the controller just switches the glide slope transmitter to whichever end of the runway is appropriate. The pitfall in this procedure is that there's no way of

Instrument approaches require early planning and close crew coordination.

knowing, through cockpit instrumentation, if he's got the right glide slope. If you're the first one to make the approach after a change in runways, the only way to know if things are correct is to ask the tower if he has switched glide slopes and then double-check the altitude at the marker or some known point as indicated on the plate page.

At Outer Marker

Another critical period for good crew coordination and cockpit discipline is between the outer marker and touchdown; it becomes even more critical as minimums are approached. At United Airlines the captain flies the approach and the first officer monitors the approach very carefully, always staying on instruments. As minimums are approached, the captain starts looking up as part of his scan. At minimums he looks up and either elects to land if he has contact with the runway or approach lights, or he elects to go around. If he elects to land, the first officer calls out the airspeed, sink rate, and any digression from the approach path. At this point, any excursions would be extremely small. If the captain elects to go around, he must announce the fact in a positive tone so the first officer is cognizant of the action as it is taken. Since the first officer has continued on instruments, he is aware of everything that's going on and is in an excellent position to bring any discrepancy to the captain's attention. It's a technique that has worked beyond our best expectation.

In VFR weather, a stabilized approach could be established as low as 500 feet AGL and be perfectly satisfactory. During marginal IFR, however, the outer marker is the place to be stabilized. This allows the autopilot to operate in an optimum manner, gets all the routine out of the way (checklists, etc.), and allows full concentration on the approach itself.

After Touchdown

Speed control just prior to touchdown is extremely important. The airplane at proper speed will land very close to the 1,000-foot point and have the remainder of the runway for a relaxed deceleration. The overspeed airplane will have a tendency to float, will touchdown long, and will require hurried action to begin deceleration.

Land in the middle of the runway! The bigger the airplane, the harder it is to detect a skid. And in a big airplane, if you land on one side of the runway, the chances are excellent that by the time a skid is detected the wheel trucks may be off the runway.

When snow or ice is present, it is especially essential that no turnoffs be attempted until the aircraft is moving very slowly. This is because bleed-offs and taxiways have a lower priority in snow and ice removal than runways. And properly so.

Two other things also relate to deceleration technique — brakes and nose wheel steering. To me, brakes are essential for parking and maneuvering in the ramp area. The rest of the time they're the ace-in-the-hole, the trump card. A well-planned and flown approach, with touchdown at the proper spot at the proper speed, will do more for stopping, especially during slippery conditions, than any brake. It should be kept in mind that any braking reduces the cornering capability of the tires. If you want to stop within the confines of the runway, brakes should be used only after spoilers and reversers are ineffective and speed has been reduced to a minimum.

These have been some of the general items that need to be discussed in the area of safety. Of them, the human factors will continue to be our most serious challenge. They are the most difficult to get a handle on because each individual is different. There are no rules to cover everyone's idiosyncrasies. The methods of measuring results are nebulous at best, but each of us must do the best we can and help where and when we can. And we must each develop sufficient self-discipline so that we can assure ourselves that we're part of the solution, not part of the problem.

— Flight Safety Facts and Analysis

Got a complaint? Who doesn't? Aircrew members and support personnel alike just naturally spend part of their day complaining — sometimes for good reason, sometimes not. Nevertheless, we all have our pet gripes and here are a few you've probably heard from time to time. Could be that you'll find your favorite on the list.

Complaints You've Always Wanted To Make

Aircrew Members

Looking for an alternate upon arriving at a socked-in field in an area that was forecast to be "hot and dusty."

The odor of an electrical fire — making it necessary to turn off all aircraft electrical power to find out where the smoke is coming from.

GCA controllers holding down their microphone buttons while the pilot is trying to transmit a message declaring an airborne emergency on final.

Maintenance personnel who delay takeoff because they aren't authorized to sign off the red X symbol and can't locate anyone who is.

Carrying baggage from the airplane to base ops, a half mile away, because of the inefficient crew transportation.

Clearance delivery voices reading faster than the copilot can write — or think.

Amended clearances in a strange area with lots of foreign sounding clearance limit points.

En route, stopping at an Air Force Base and finding that the only eating facility available is closed for cleaning.

Support Personnel

Pilots who blame the weather forecaster when their destination weather isn't as forecast — especially pilots who divert to their new destination and never bother to get another weather briefing.

Crews who write up such things as "electrical odor in the cockpit" due to smoldering fires in cockpit ash trays.

Pilots keying their mikes on GCA final, cutting out course and glide path information because they forget to use guard channel to transmit emergency information.

Crews who wait until it's time to start engines before checking the 781.

Aircrews returning from a six-hour trip complaining because they had to wait five minutes for transportation.

Pilots who say they're ready to copy clearances before they have pencil in hand and cause a tie-up of communications while the clearance is repeated.

Pilots who don't bother to familiarize themselves with the names of fixes or routes of flight indicated on their own clearances.

Being the only all night cook in a flightline snack bar when a fully loaded passenger aircraft stops for a two hour ground-time.

Weather phenomenon is one of the most predominant factors in aviation, and it's subtleties and severities have triggered many aircraft accidents and resulted in numerous tragedies that could have been avoided.

The most publicized of these accidents usually involve civilian airliners, but MAC aircraft fly under similar conditions with a peacetime mission very much like that of the airlines. Neither is immune to the meteorological hazards associated with approaches and landings, a fact borne out vividly by accident statistics. And while the following two accident narratives involved civilian aircraft, they are perfect examples of some of the hazards of the trade.

Almost Made It

Stewardesses were making their passenger check to be sure that everyone's seatbelt was fastened when the captain radioed approach control that the field was in sight. The controller had reported the weather as partially obscured, four miles visibility in haze and smoke, and wind from 340 degrees at three knots. Both ILS approaches and visual approaches were being made to runways six right and seven left. Approach control cleared the 707 for a visual approach to runway six right.

It was an exceptionally clear night aloft. Another airliner, ahead of the 707 in the pattern, had also been cleared for a visual approach to runway six right. That flight was on final at 800 feet when the local controller advised the captain of that aircraft that fog had just formed at the west end of the runway and to use caution. The captain reported that there appeared to be more fog on runways seven left and seven right than on runways six left and right. He landed on six right with no difficulty. His report was relayed to the approach controller, but the 707 was not advised of these conditions.

The 707 was cleared to land on runway six right and the local controller reported the runway visual range (RVR) at 5,500 feet. The flight continued inbound with the first officer flying visually from his normal position and the captain handling the first officer's duties. The first officer began a descent when the glide slope was intercepted. At the time, the entire airport was clearly visible.

The captain monitored the ILS glide slope and at 800 feet advised the first officer that the aircraft was slightly below it. The first officer initiated corrective action as the aircraft flew in and out of patchy clouds. As it crossed the threshold and was about to flare, the aircraft was suddenly swallowed up in a patch of shallow ground fog. The crew lost all outside visual reference. The flight engineer, watching the last portion of the approach, saw the first officer's glide slope indicator move up to the top of the instrument case just as the 707 touched down hard in a near three-point attitude.

A fire broke out in the nose wheel area as the plane rolled down the runway. The aircrew, smelling smoke, stopped the 707 and ordered an evacuation. The passengers were evacuated but eight were injured while exiting. Some fell off the evacuation slides or contacted the ground too hard at the bottom. Others were injured when they jumped, fell, or were pushed off the wings by other passengers. The aircraft was destroyed by fire.

During the accident investigation the first officer said that he was just about to flare the aircraft for landing when it entered the fog. He said that once he lost outside reference he maintained the existing attitude until touchdown. The flight data recorder showed that from 17 to nine seconds before touchdown the average rate of descent was 375 feet per minute and the indicated airspeed decreased from 157 to 150 knots. From nine seconds before touchdown until touchdown, the average rate of descent was 1,400 feet per minute and the indicated airspeed decreased from 150 knots to 147 knots. Just after touchdown, the vertical acceleration peaked at a plus 4.60G load, immediately followed by a minus 0.2G load.

Mishaps with a Moral

The National Transportation Safety Board concluded that the airplane touched down nose first and that the fire started when the nose wheel collapsed rearward. The probable cause of the accident was listed as the continuation of a visual approach after the flight crew lost outside visual reference because of a low cloud and fog encounter.

This is one to think about the next time you go IFR near the runway just when it appears "you have it made."

High, Hot and Fatal

The flight whined through murky skies with its 83 passengers and crew of five after having experienced several delays due to poor weather conditions in the northeastern United States.

Piloting the DC-9 was the first officer, in the right seat. The captain performed copilot duties from the left seat.

Destination weather was reported as partial obscuration, estimated 400-foot overcast, one and one-half miles visibility and fog.

The flight was cleared to 3,000 feet as the crew prepared for radar vectors to an ILS to runway four right. Under normal circumstances, approach control would have directed descent to 2,000 feet, from where the approach is normally initiated. But a potential traffic conflict with another aircraft at the same altitude drew the controller's attention and the descent was delayed.

When the flight was finally cleared for the approach, the plane was approaching the outer marker. By the time it passed the outer marker it was 200 feet above glide path; 46 knots above the approach speed recommended by the company and 63 knots above the minimum computed speed. As the crew struggled to catch up with the sequence of events, the captain contacted tower for landing clearance. Tower cleared the flight to land and reported the weather as RVR more than 6,000, a fog bank moving in, and fog "pretty heavy" across the approach end.

Conversation between the first officer and captain indicated that neither of them fully trusted the localizer display and that the first officer was still having problems staying on course as the flight approached minimums. During most of the final approach the airspeed was well above the computed 123 knots.

Twenty-two seconds after receiving clearance to land, the DC-9 smashed into a seawall about 165 feet right of the extended runway centerline and about 3,000 feet short of the runway displaced threshold. The impact and subsequent fire destroyed the aircraft and there were no survivors.

The National Transportation Safety Board determined that the probable cause of the accident was the failure of the flight crew to monitor altitude and to recognize passage of the aircraft through the approach decision height during an unstabilized precision approach conducted in rapidly changing meteorological conditions. The unstabilized nature of the approach was due initially to the aircraft's passing the outer marker above the glide slope at an excessive airspeed and was compounded by questionable information presented by the flight director system. The Board pointed out that the poor positioning of the flight for the approach was in part the result of nonstandard air traffic control services.

There was some question as to whether the flight director switch was positioned in the APP mode or the G/A mode during the approach. Examination of the wreckage verified that the switch had been in the G/A position on impact. In the G/A mode, localizer signals are removed from the flight director system.

The overriding factor in the accident was the crew's preoccupation with the flight director's presentation. This led directly to the crew's failure to monitor altitude and to recognize passage of the aircraft through decision height.

Landing in low visibility demands optimum cockpit discipline.
Here are two examples of what can happen without it.

The Secret of Cordillera Real

Air traffic structures in remote regions of the world can lead aircrews to disaster. This is an account of one such crew.

by Capt A. R. Barbin
Associate Editor

An Air Force sergeant sat in his car and watched as fog banks rolled across the airport, alternately opening and closing the runway to air traffic. Anticipating the arrival of an inbound MAC jet, he heard the whine of a landing aircraft. But as the plane emerged from the foggy runway, he was disappointed to see that it was a commercial aircraft.

Becoming concerned about the cargo flight, the sergeant inquired at the civil air traffic control office. An air traffic employee said that the aircraft should be overhead any minute. The sergeant returned to his car. Another plane landed, but it still wasn't the cargo jet. This time the sergeant by-passed the air traffic office and went directly to the tower to determine the status of the MAC flight. He talked to the tower controller who said that the flight should have been holding over the field but that he had lost contact with the aircraft. Twenty minutes after its scheduled arrival, renewed attempts to contact the flight had still proven fruitless. Neighboring ACCs were contacted but they reported no contact with the aircraft. An extensive communications search throughout the continent produced the same results.

Search in Vain

The communications search and the sergeant's anxiety could have continued for days, but the result would have been the same because the aircraft had slammed into the side of a mountain just 15 miles from its destination.

Following the tragedy a team of investigators was dispatched to the base. After days of delving into the accident, team members pieced together the facts upon which this article is based.

Chronology

The crew was alerted, at 0315, by the hotel clerk at their last point of departure. After breakfasting in the hotel cafeteria, they walked out of their hotel and began the drive toward the air base and their waiting airplane.

The two pilots and the navigator went inside the operations building to fill out the paperwork and prepare for the long flight south that would propel them almost 1,800 miles over some of the most forbidding terrain in the world. Along their route, river and jungle give way to marshy lowlands bordering the lofty backbone of some of the world's highest mountains. This north-south mountain chain, called the Cordillera Real by the local inhabitants, thrusts its way up to heights of 24,000 feet. To the west of this imposing mountain chain lies the broad altiplano, or high plain, with an average height of 12,000 feet above sea level. The destination airport is located on the plain, just 15 miles southwest of the mountain chain.

Collecting the miscellaneous paperwork and forms, the officer crew members filed their flight plan and were briefed on the route and destination weather. Thunderstorms were expected west of the climbout course, isolated CBs and cirrus en route, extensive cloud cover across the cordillera, and layered cloud decks from 34,000 feet down to approximately 700 feet at destination.

At the aircraft the pilots checked aircraft status forms and prepared their respective crew positions for flight; the navigator

began the time-consuming process of programming the navigation computers and spreading route maps across his navigation desk. After completing the last of his aircraft inspections, the flight engineer made his way around the cargo pallets toward the cockpit. The scanner unravelled his lengthy communication cord, adjusted his headset, and assumed his post in front of the silent cargo jet.

Slowly revolving the scroll checklist, the copilot quarterbacked precise verbal exchanges among the crew that soon brought the dormant airlifter to life. Not long after the turbofans stabilized in a familiar whine at idle r.p.m., ground control radioed the IFR route clearance and taxi clearance to the crew. The loaded aircraft inched its way free of its parking spot toward runway 36.

" . . . wind calm, change to departure control frequency, monitor guard channel, cleared for takeoff. Good day, Sir."

Climbing to flight level 330, the aircraft banked to a southeasterly course.

About an hour after takeoff the aircraft approached the last VOR and NDB fix available for nearly 550 miles — the end of civilization and the beginning of a vast area of impenetrable jungle and volcanic cordillera. With their destination still more than 1,300 miles ahead and with only one more VOR/NDB fix remaining to point the way, the crew's only link with the outside world over most of this void was via their scratchy and often garbled HF transceivers.

As VOR and NDB navigation signals faded, navigation and doppler computer displays identified the remote airway and rhythmically clicked off the miles to each succeeding invisible reporting point over the jungle.

Somber mountain climbers trek toward the wreckage.

Real

Flying deeper into the continent at flight level 370, the horizon and imposing mountains to the southwest lay hidden behind a mask of clouds layered up to 34,000 feet. Less than 130 miles from destination, one of the pilots radioed the Area Control center (ACC) on HF and requested the tower frequencies at destination airport. Attempts to contact tower proved fruitless.

The crew requested ACC to relay their destination ETA and descent request. ACC acknowledged and cleared the aircraft to descend to flight level 240. The plane was approximately 10 minutes from destination when ACC relayed the active runway, landing weather information, and requested that the flight attempt to contact tower again. Level at flight level 240, the crew established radio contact with the tower.

Since there is no radar to pinpoint aircraft position, the usual, though unwritten, procedure was for tower controllers to clear an aircraft to the published initial approach fix based upon its estimated position of three minutes from the VOR. The tower controller answered the initial call from the inbound flight, "Roger, confirm your flight level and your estimate over the VOR, over."

"We're at flight level 240, estimating over the VOR in about three minutes."

"Roger, continue descent to one eight zero for a VOR locator approach. Wind zero nine zero at eight. Runway in use zero nine, visibility west southwest and northwest twenty kilometers. Ceiling estimated four hundred, three to four hundred meters, temperature one, altimeter setting three zero seven four. Report reaching the VOR, over."

"Roger, say again the altimeter, please."

"Altimeter setting three zero seven four, thirty seventy-four, over."

"Roger, three zero seven four. Confirm."

"That is correct, affirmative."

There was no further radio contact with the flight.

The Peak

The next morning a pilot flying over the area spotted a crash site near the peak of one of the tallest mountains in the Cordillera Real. Days later a mountain climbing team, thoroughly briefed by on-scene accident investigators, began the difficult ascent to the crash site. At the 18,700-foot level, the team found what aerial photographs had indicated. Apparently descending to flight level 180, the MAC jet had slammed into a nearly vertical glacier about 1,300 feet from the peak.

Why? What combination of human or procedural errors had caused a well-rested, highly qualified crew to ram a perfectly operating aircraft into a mountain? Perhaps we will never know, but several aspects of the accident became evident almost at once.

Whether from years of flight conditioning in radar environments or a false sense of security upon being cleared for descent to the VOR initial approach fix, the crew flew below the published minimum sector altitude of 21,300 feet. The descent from flight level 240 apparently was based on the crew's own estimate of their position, although available ground radio navigational aids were insufficient to permit the arcrew to determine the aircraft's precise position during the last 786 miles of flight.

The crew thought they were well clear of high terrain. But there was neither ground radar nor tacan to provide this safe assurance, and the primitive air traffic services common in such geographical regions demand an extremely high degree of caution.

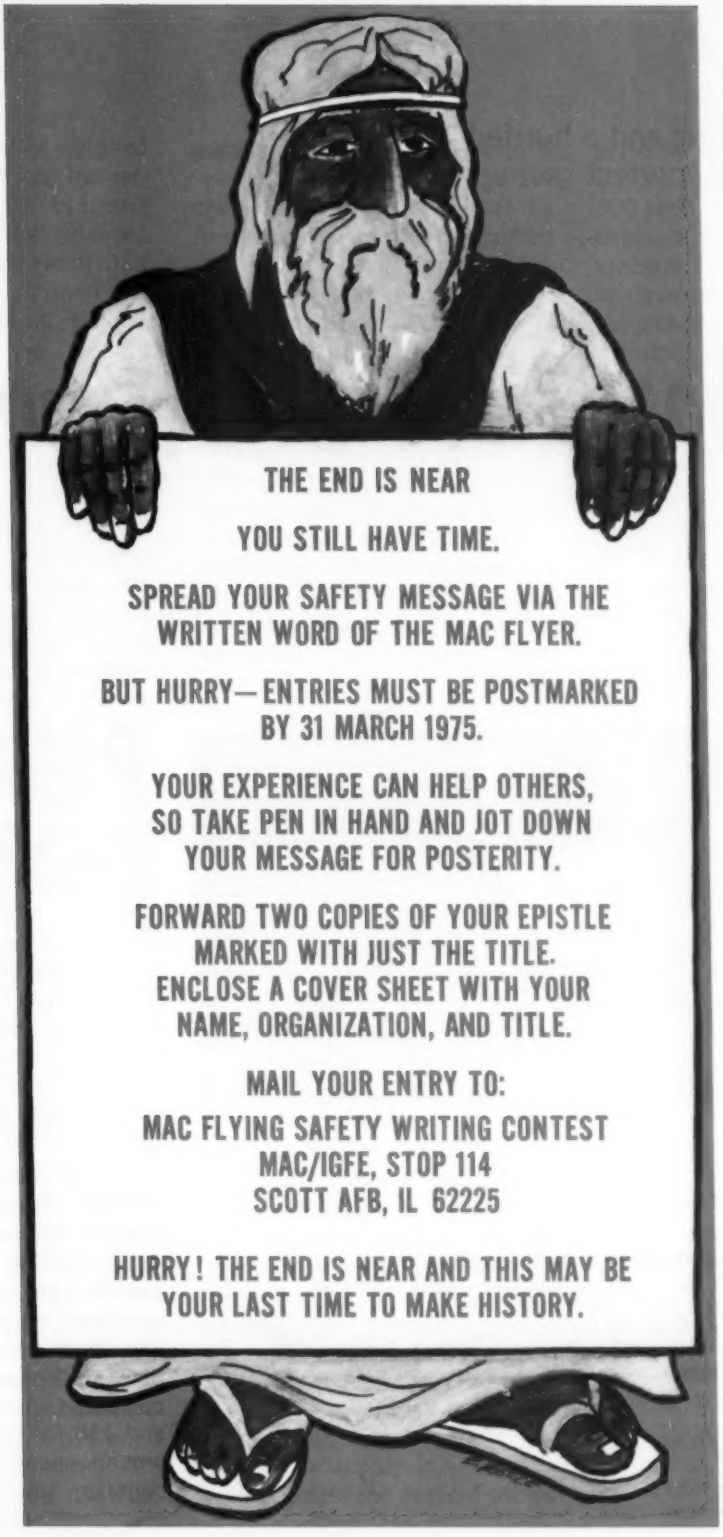
Ironically, just two weeks earlier the crew of another military cargo jet — fortunately, this one was in visual flight conditions — was issued virtually the identical descent clearance. It descended to flight level 180 but diverted from its course to avoid collision with the mountain.

Undeveloped Controls

Military and commercial crews fly sophisticated aircraft which, in many instances, are matched with equally sophisticated air traffic control equipment. But this is not always true, and in many parts of the world terrain clearance becomes the most demanding part of a flight. In many of the less developed areas, basic air traffic services that are commonplace in the United States and other developed countries, are a thing of the future. Dissimilar en route procedures and terrain avoidance criteria, coupled with unreliable navigational facilities, dictate total crew commitment to clearing obstructions.

Most of the crews who operate into such hazardous areas understand the limitations of their environment. But this may not be so well understood by crews who only occasionally fly off the beaten path.

Will crews flying future missions into similar remote and potentially hazardous regions permit their awareness of danger and caution to momentarily lapse? If they do, their mission chronology will be sadly retold — just like this one.


THE END IS NEAR
YOU STILL HAVE TIME.
SPREAD YOUR SAFETY MESSAGE VIA THE WRITTEN WORD OF THE MAC FLYER.
BUT HURRY— ENTRIES MUST BE POSTMARKED BY 31 MARCH 1975.
YOUR EXPERIENCE CAN HELP OTHERS, SO TAKE PEN IN HAND AND JOT DOWN YOUR MESSAGE FOR POSTERITY.
FORWARD TWO COPIES OF YOUR EPISTLE MARKED WITH JUST THE TITLE. ENCLOSE A COVER SHEET WITH YOUR NAME, ORGANIZATION, AND TITLE.
MAIL YOUR ENTRY TO:
MAC FLYING SAFETY WRITING CONTEST
MAC/IGFE, STOP 114
SCOTT AFB, IL 62225
HURRY! THE END IS NEAR AND THIS MAY BE YOUR LAST TIME TO MAKE HISTORY.

A sketchy briefing and a hurried single engine approach is a perfect set-up for a . . .

Short Lived Go-Around

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During climb out, the T-29's left engine began backfiring severely. The pilot reduced power and started back toward the base. As the aircraft made its way toward the safety of the long concrete strip, the flight mechanic reported heavy white smoke pouring from the engine and advised the aircraft commander to shut it down. The aircraft commander took the advice and feathered the propeller.

The crew declared an emergency and received clearance to a nearby civilian airport. As the aircraft descended, the pilot briefed his crew on the emergency landing and obtained approach speeds from the flight mechanic for flap settings of 12 and 28 degrees. Using a weight of 37,000 pounds, the mechanic computed speeds of 106, 107, and 116 for threshold speed, go-around speed with flaps at 12 degrees, and climbout speed clean, respectively.

The aircraft actually weighed 39,700 pounds; therefore, the correct speeds were 110, 111, and 121 knots. The pilot was unaware of the correct speeds. He did not brief the approach, missed approach, and go-around. Neither did he mention the landing ground roll distance. To lose altitude and keep the aircraft in the vicinity of the airport, he made 360 degree turns during descent and rolled out high on a four to five mile final. He flew the steep approach with the gear down, 28 degrees of flaps, and 110 knots. ADI was not used for the approach even though nine to ten gallons remained in the tank. During the early stages of the approach the copilot told the pilot he thought they were "high and hot," but he never mentioned this again.

The aircraft crossed the approach end of the runway at 110 knots and 200 to 300 feet above field elevation. It continued descending until reaching an altitude of 25 feet, some 2,000 feet down the runway. At this point its rate of descent was more than 1,000 f.p.m. The copilot, certain that a safe landing could not be made, called, "Go around!"

The aircraft commander raised the nose of the aircraft, momentarily stopping the rate of descent, and then applied maximum power to the right engine. By then the airspeed had dropped below the threshold speed of 110 knots. The wing flaps were reset at 12 degrees, but the aircraft commander did not apply aileron to keep the right wing down. The landing gear remained down because the copilot didn't hear a command to raise it. Now in a "power-on stall" regime, the aircraft veered toward the left of the runway, descended, and impacted in a left-wing-low, nose-high attitude. The plane caught fire and was destroyed, but the crew of three escaped without injury.

Analysis

Rushed emergency procedures, incomplete planning and briefing, and incorrect go-around procedures turned this flight into a nightmare. Although a rough running engine is enough to cause concern, this situation quickly worsened when the flight mechanic noted smoke coming from the augmentor tubes. Since white smoke can mean a magnesium fire — bad show — he took combustion away from the engine to arrest the possible fire.

The cause of the smoke was actually a failed push rod. Although a single engine landing at high density altitude (more than 3,300 feet in this case) can get a little tight, a safe recovery can be made if the crew follows proper procedures. Unfortunately, this aircraft commander hurried his crew briefing and omitted some important items. Since a go-around on one engine in a T-29 must be done "by the numbers" to insure success, the pilot might have saved himself grief by reviewing go-around procedures with his crew. His plan for the approach was also sketchy. He accepted a "high and hot" final — from which he corrected to a steep, slow approach with gear and flaps down — because he misjudged the descent pattern.

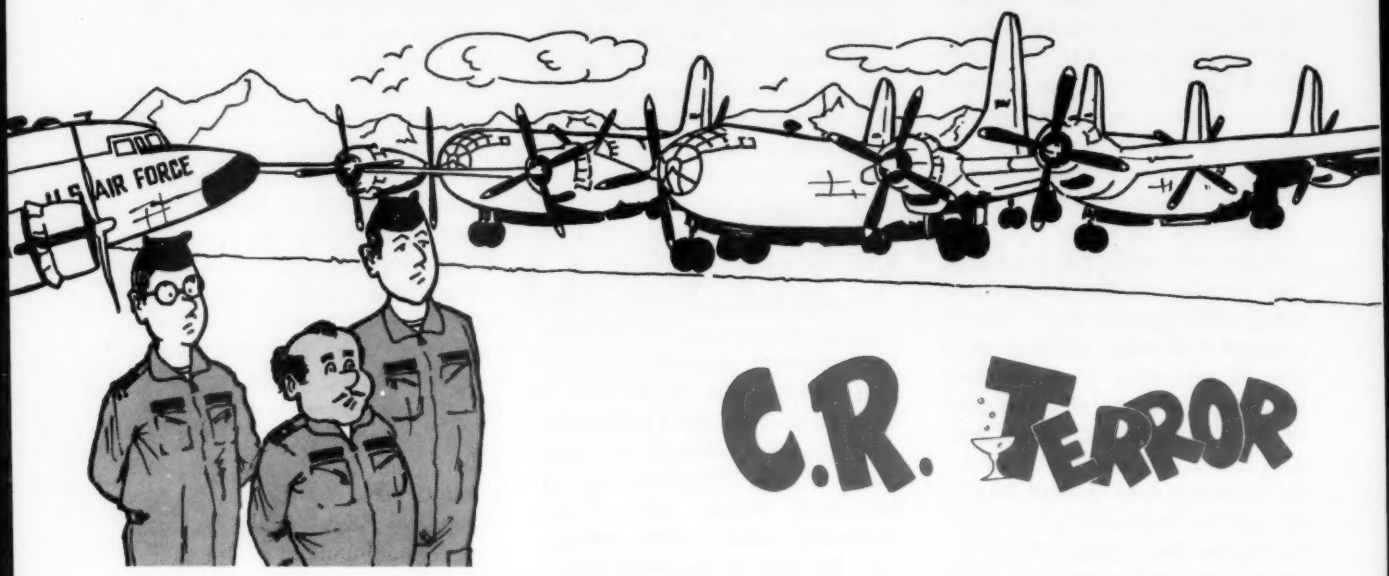
It's difficult enough to land a perfectly operating aircraft after coming over the fence at 200 to 300 feet. In this case, the single engine approach compounded the problem. Even so, had the aircraft commander decided to go around early enough and followed recommended procedures, he probably could have avoided the crash. Instead, when the copilot called for a go-around, the pilot allowed airspeed to bleed off as the nose was brought up. The flight mechanic managed to get the flaps up to 12 degrees at the pilot's command, but the copilot said he never heard the pilot call for gear retraction. So with decreasing airspeed, added torque from a single engine go-around, and dragging landing gear, the Convair entered what the Dash One refers to as a "power-on stall." The left wing dipped as the T-29 descended into the grass near the runway. The aircraft broke apart and immediately caught fire.

Conclusions

Most crew members have reviewed emergency procedures so thoroughly that they handle emergencies with ease. Others, who may be less familiar with their procedures, could find the going tough. A word to the wise for this latter group is: When you forget, or just don't know, take your time and review the procedures. Otherwise you could cause yourself more problems than you are capable of handling.

Knowledge of procedures, proper planning and execution, and crew coordination could have prevented this crash. These elements are a few of the keys to safe flight.

The Ace of Aerospace comes up with an itinerary change that guarantees an overnight stay at one of his favorite spots.



C.R. TERROR

"Some trip," C. R. complained gruffly, sincerely disappointed at the turn of events which had altered his flight from a Davis-Monthan RON to a long, one-day trip.

"How can these flight management weenies do this to me? Flying a beat-up Convair to the boneyard is one thing," he moaned, "but flying out and dead-heading back the same day in a T-39 is not my idea of a pleasant trip."

The Loud One and Long Suffering Sam ambled across the nearly empty parking ramp to their lone Convair, its exterior as sleek and graceful as the maintenance people could make it for this final mission.

"Yeah, Boss," sympathized Sam, "I know how you feel. A good trip turned a little sour. But look at it this way. In no time at all we'll both be checked out in the T-39 and then we'll be the ones winging our way across the skies above all the weather and low flying cloud-bangers."

C. R.'s heart had been set on renewing acquaintances with a generous, non-liberated female friend in Tucson, and Sammy's eager solace was no comfort at all to the Lothario of the Airways. Nonetheless, C. R. had not given up all hope for an RON. He still had Alternate Plan "A" up his sleeve and grinned inwardly as he thought of the refueling stop at Tinker, another of his favorite RON bases.

The Master Manipulator smiled slyly as he considered his alternate plan.

"Attaboy, Sir," boosted Sam, mistaking his boss's grin as an expression of humble acceptance of unalterable fate. "We'll make the very best out of this trip. Yes, Sir."

Sam was still rattling off the lineup checklist items as the Convair broke ground at C. R.'s usual in-the-ball park takeoff speed of 115 knots.

"Ah, Sammy Boy. Never did learn to expedite things in this bird did you," C. R. chided. "Get the flaps up, Sergeant Torque, and let's start thinking in terms of tonight's activities in Tucson or, er, some other equally exciting spot."

"Sir, it's gonna take a long time to get to Tucson with the wheels still down," giggled Sam, bravely risking the prospects of a tough trip for the fleeting pleasure derived from this quick quip.

"Ah, yes, m'boy. How right you are. Gear up, flaps up, meto power, climb power and after take-off-climb checklist. Cruise power when we level off followed immediately afterward by cruise checklist," replied C. R. in a surprisingly pleasant tone. "You have the aircraft, Sammy. I have some high-level thinking to do."

As the aircraft approached two

miles on final at Tinker, the Able Aeronaut again took control and was in the midst of a headquarters joke when the Convair banged down nosewheel first on the first 50 feet of the 11,000-foot runway.

"Yuk, a terrible downdraft must have caught us," he complained sheepishly. The force of the landing knocked Sammy's headset off, and it was dangling precariously around his neck, giving the impression of some type of neck brace. But the loyal copilot said nothing and riveted his eyes straight ahead as the Convair weaved down the runway. Sergeant Torque mumbled something under his breath and checked all the circuit breakers to see whether any had popped out upon impact.

After parking the aircraft, C. R. hurriedly made his way down the entrance steps and squinted toward number two engine.

"M'lads, better take a look at number two," he enticed, slipping off his pigskin gloves. "Most oil I ever saw on any one engine."

Unaccustomed to such close scrutiny by Major Terror, Sergeant Torque quickly walked around the engine, scanning it closely. "Sir," he promised, throwing a puzzled glance toward Sammy, "my professional opinion is that we have more oil on number one than on number two, and number one is as dry as a Pennsylvania oil well."

"Well, ah, might have them look at it, anyway. Can't be too safety conscious these days, you know," the Silver Tongued One instructed. "I'm going inside to check weather while you guys refuel and check on the leak."

C. R. waddled across the flight line and disappeared into base ops, leaving Sergeant Torque and Sam staring at each other in awe.

"One thing you can say about our boss," volunteered Sam, "you never can outguess him. Never saw him so safety conscious in my life."

An hour and a half later the two crewmen spotted C. R. walking briskly across the flightline toward the aircraft, munching on the remnants of his lunch.

"If you say the engine looks all right, then it's all right with me," conceded the Paunchy Pilot. "Let's kick the fires, light the tires, and head for Old Tucson. Here, I bought you guys a submarine sandwich. You can eat it on the plane."

"We're all fueled and ready to go," Sammy informed his boss. "Maintenance took a look at the engine and couldn't find anything wrong, so it looks like we're all set. How's the weather at Davis-Monthan?"

"Sammy, m'lad, the gods are with us. The weather at Davis-Monthan will be near minimums by the time we get there," the Able Aeronaut revealed cheerfully, "and you can't beat them apples."

"But, Sir," gasped Sam, "how have the gods smiled on us if we're going to run into such bad weather in Arizona. What I mean, is, well, what's so good about minimum weather?"

"Obviously, my boy," C. R. bantered, "you have not bothered to acquaint yourself with our entire mission profile. The weather will be at minimums when we arrive. It is forecast to go below minimums an hour after we get there, hee, hee, hee." The Pudgy Pilot could hardly contain himself. "And the T-39 that's supposed to pick us up isn't scheduled to arrive until two hours later. By that time the weather will be so lousy you'll need a seeing eye dog to walk from one runway light to another. And you know what that means, Sammy?"

"That we'll probably have to go to our alternate?" Sam conjectured.

"Sammy, you're a slow learner. It means we spend the night in Tucson — off base, hopefully," giggled the Master of Wires and Tires, "in the manner to which MAC has refused to let us become accustomed."

"Sir," broke in Sergeant Torque, "I'm all set to go if you are. Did you get the takeoff data from weather? I'll figure a TOLD card."

"No sweat," replied the Dauntless One, removing the burned out Egyptian Oval from his ebony cigarette holder and throwing the butt on the ramp, "we'll use the same data as before."

The Convair was level and headed in a southwesterly direction when the weather began to deteriorate.

"Just as anticipated, Sammy, old boy; just stay with the Old Master and you'll learn a lot about flying machines and such," boasted C. R. as the Convair bumped in and out of broken clouds.

"Sir, I'll check METRO if you'll monitor center frequency," suggested Sam. "I wouldn't want us to get cut short on fuel if the weather goes below minimums before our arrival."

Sam dutifully copied the weather and turned to his smiling boss.

"Looks like you were right, Sir. Weather's gonna be three hundred and one, light rain with wind from two six zero at twenty knots," reported Sam, apprehensively.

"Hummph," retorted C. R. "Hope it goes down lower by the time we've been on the ground

C.R. TERROR

awhile. Wouldn't want any Sabreliner crew spoiling our whole trip."

"Shave Three Two, this is Tuscon Approach, radar contact. Expect a precision approach to runway three zero at Davis-Monthan. Weather, three hundred feet, broken, visibility one mile, deteriorating rapidly. Wind two eight zero at fifteen, gusting to twenty, altimeter two nine eight five."

"Thinking ahead in an aircraft is an important trait, Sammy Boy," philosophized the Ace of the Airways as he gently turned the Convair onto final approach, "and I'm thinking ahead to about three hours from now. A night on the town. Smile up, Sammy. Don't look so downcast, m'lad."

"Sir, while you were talking, he said to begin descent. Gear is going down, Sir. You're high on glidepath. Heading is two nine five," broke in Long Suffering Sam, apologetically.

"Er, thank you, m'boy. Hmmm. Must be controller training in progress. This guy is really mad," complained C. R. as the Convair alternately passed through glide path and course.

"Three miles from touchdown. Well below glidepath and well right of course," warned the controller as C. R. rapidly approached minimums. "Shave Three Two, the weather is now two hundred feet and one quarter mile, wind two nine zero at twenty knots, altimeter two nine eight five.

"Sir, the field is below minimums," gasped the now puckering Sam. "Go around."

Perspiring nervously, but driven by an unquenchable desire to RON, C. R. continued descending, alternately eyeing the flight instruments and searching for the elusive runway lights.

We'll duck under it. Think I see the runway now," shouted C. R.

"—too low for a safe approach," came the controller's voice. "Acknowledge, Shave Three Two."

"Runway's at eleven o'clock, Boss. Hey, we're too low! We're about to land in the desert — take it around," shouted a pale-faced Sammy, thrusting both throttles forward. But the bird just shuddered on the brink of a stall and settled down with a half dozen thumps. C. R. was still attempting to firewall the throttles as the aircraft bumped to a stop.

"Almost didn't make it, m'lads — due to that lousy controller. And I must say, that runway overrun is the roughest I've ever seen. But here we are, safe and sound at Davis-Monthan."

"Safe, perhaps, but not sound," complained Long Suffering Sam. "Do you know where we are?"

"Well, the visibility is mighty bad, old chum, but I think we've locked a brake and skidded onto the taxiway. Look, there's a row of airplanes just ahead."

The three crewmen strained their eyes through blowing sand in the direction of the parked aircraft. Sergeant Torque was the first to comment.

"Sir, don't look now, but that's a row of B-50s we're looking at."

"Don't be absurd, m'man, The Air Force hasn't had B-50s for years," protested C. R., "but it sure looks like — and Gooney Birds!"

"Sir," gulped Sam, "guess what?"

"Aggh, we've landed in the boneyard."

"Boss," sympathized Sam, "I tried to warn you. The weather was just too bad to land. What are we going to tell them when they ask what happened?"

"Well," gulped the Disabled Aeronaut, "we could say we just followed instructions."

"How's that, Sir," questioned Sergeant Torque, unbuckling his seat belt.

"We delivered our Convair to the boneyard," C. R. sighed, "as advertised."

A Gold Watch for the Convair

Another of the historic prop planes retires from active service.

by Maj George D. Burgess, Associate Editor

Word that the Convair T-29s and C-131s would soon be retired from service — some have already flown to the storage facility at Davis-Monthan AFB, Ariz. — causes nostalgic reflection for the students, passengers, patients, and aircrews who flew on the aircraft during the past 25 years. Pushed into a support role in the jet age, the T-29s and C-131s have performed well, but from an economical standpoint, have outlived their usefulness. Removing them from the active service releases money to purchase and operate more modern weapon systems.

Based on the commercial Convair 240 series aircraft, the first of the "Convairs" (as they are commonly called) arrived in 1950. The T-29A was unpressurized, but the pressurized "B" model followed two years later. A year after that the first "C" and "D" models, with more powerful engines and increased performance, were accepted.

The transport variant, the C-131, was delivered in 1954. Produced with casualty evacuation equipment for 27 litters or 37 passengers, it was equipped with a large loading door for stretchers and cargo. In all, a total of 472 Convairs were produced for the Air Force.

Until it was replaced by the C-9 in the 1960s, the Convair was MAC's front line domestic air evacuation aircraft. After being replaced in this role it assumed its recent support role. Aircrews in many commands maintained proficiency in it and it also served as an airlift resource during the 1970s. What, if anything, will replace the Convair in its support role has not been divulged at the time of this writing. Some support pilots are being excused from flying duties while others are transferring to the T-39. Whatever aircraft replaces the T-29s and C-131s, few can boast of a more enviable record than the humanitarian, training, and transport legacy left by the "Convairs."

Quick Stoppers

Delayed Reaction

The C-130 was cruising VFR at flight level 190 when the pilot's side window shattered. Pressurization held, so he brought the plane down to 9,000 feet and depressurized it. After landing, maintenance removed the window and found a quarter-inch burn mark on the lower rear corner of the frame. Cracks in the inner pane appeared to have originated from the burned area.

The aircraft had experienced a lightning strike a month earlier and, although no lightning damage was discovered at the time, there is a strong probability that the window was weakened by the lightning strike and cabin pressure differential finally caused it to shatter.

It's a matter of conjecture whether closer scrutiny after the lightning strike would have revealed the damage, but this incident serves as prime evidence that there's no such thing as inspecting an aircraft too closely following a lightning incident.

Turn, Crackle, Snap

The third pilot was standing between the seats of the T-39 on a local transition flight, clearing for other aircraft while watching the instructor pilot demonstrate an overhead pattern. During a steep turn to initial, one of the third pilot's ankles, weakened by a previous injury, gave way under the force of two G's. The ankle snapped and the man fell to the floor. The flight was quickly terminated.

Wing directives called for a safety observer between the seats during this phase of flight — the only difficulty here was that he didn't brace himself well enough during the maneuver — the doctors did that later.

Robin Strikes

Months during which aircraft are most vulnerable to bird strikes are September, October, and November, with half of the reported strikes occurring near airports and below 2,000 feet.

True to form, an EC-135 took it on the nose — in October, at 1,000 feet AGL, and in the traffic pattern. This time a female robin struck the windscreen causing no damage, but her companion punctured a four inch hole in the wing leading edge. The aircraft was going about 150 knots at the time. Wonder what would have been the result of a 400-knot collision?

A Bum Line

A tug driver strained his eyes, searching for obstructions, as he towed a C-130 through the dark, unlighted ramp area. Following a yellow line between a row of parked aircraft, he could barely see the aircraft on either side of the taxi lane. He looked right to his wing-walker, and the wing-walker gave him the "all's well" sign, indicating there was sufficient wingtip clearance. Then as he looked to his left, he saw the left walker frantically signalling for a full stop as the left wing of the towed aircraft struck the vertical stabilizer on another C-130.

The causes of this incident included towing the aircraft along an obsolete taxi line which had not been obliterated. A contributing cause was that the wing-walker failed to recognize the danger in time.

If you're a tow team supervisor or pilot who doesn't completely trust taxi lines (and sometimes you shouldn't), find yourself a wing-walker you can trust.

Taxi Accident

After landing at a foreign air base, the copilot taxied the T-29 between rows of parked fighter aircraft. It was a narrow squeeze as foreign national wing-walkers guided the aircraft. At one point, the copilot turned the aircraft toward the edge of the ramp to avoid a fighter tailpipe. As he did so, one propeller wiped out a taxi light. The pilot stopped the aircraft and the crew examined the prop for damage after engine shutdown. Two blades were slightly scratched, and since the third blade was standing at the 12 o'clock position, the crew assumed it too, was only scratched. They decided not to pull the prop through for a closer look and continued the mission to home station. During a postflight inspection, maintenance found that the third blade had been damaged beyond repair with a one-half inch deformation in the tip.

Among other things, this taxi accident emphasizes the dangers of following nonqualified marshallers through cramped quarters. In this case the T-29 prop tip dipped to within 12 inches of the ground while the taxi light extended up to 18 inches. If in doubt about a marshaller's qualifications, it makes sense to deplane one of your own crewmen to give taxi directions.

Unintentional Aerobatics

What is routine for the Thunderbirds is often hair-raising and hazardous for other pilots. This incredible account of a T-39's low level aerobatics is a case in point.

The Sabreliner was making VFR approaches to a municipal airport. At 900 feet, on what appeared to be another normal approach, the twin jet suddenly snapped violently to the left into an inverted position. The pilot recovered the bird to a nearly wings-level attitude and started a go-around. But before he could execute the maneuver, the aircraft rolled again, this time into a 90-degree attitude. Too low for a second recovery, the pilot brought the plane to an almost level position as it contacted the ground and slid onto an open field about a half-mile short of the runway. Miraculously, both pilots got out. Fuel was dripping from ruptured fuel cells, but there was no fire. One of the pilots received a possible compressed vertebra, but the other was uninjured. The aircraft was heavily damaged in the under belly areas and fuel cells.

What happened? Wake turbulence produced by a jumbo jet in the area probably caused this accident. Staying away from the jumbos or heavies can remove much of the danger, but when winds are slight, even smaller aircraft can cause wake turbulence problems. You can't be too cautious when the possibility of this invisible menace exists.

Qs

Physiological Psymptoms

Shortly after takeoff, the copilot placed the air-conditioning master switch to 7.45 p.s.i. He noticed that the cabin pressure indicator read a minus 3,000 feet. To correct this abnormal situation, he selected the ram position to depressurize the aircraft. Since no other malfunctions could be found, the pilot continued climbout and directed his crew to remain on oxygen. Soon after level-off at flight level 250, a crew member experienced a mild shoulder pain which he assumed was caused by a tightly cinched parachute harness. Another crew member experienced a pain in a knee joint. The pilot descended to 10,000 feet and was relieved to hear the two crew members report their pains had subsided. He landed to let the flight surgeon examine the men. The doctors returned both fliers to status after a day's DNIF.

The moral? Flight level 250 is the very maximum allowable height for unpressurized flight. And lower altitudes are recommended to prevent possible physiological problems.

Prop Goes Flying

Two miles visibility, 35 knot winds and blowing snow made takeoff difficult for a ski model C-130. However, these problems proved to be minor — compared to what followed — as the pilot guided the Hercules down the remote snow covered runway. At 80 knots, number four propeller and part of its prop gearbox flew off the aircraft. The propeller crashed into the oil cooler door, then sailed into the leading edge of the wing. The aircraft yawed as the number four throttle jumped out of the pilot's hand. He closed the throttles and, controlling yaw with reverse thrust, finally stopped the aircraft on the runway. A failure within the gearbox started the propeller on its solo act, but the crew handled this hazardous situation well by their quick response, thus preventing further damage.

Bad Bird Strike

The C-130E was VFR and about 12 miles out on a GCA when, thump! Loud noises reverberated from the radome and fuselage areas as a flock of birds ricocheted off the Herky Bird. Suddenly, the aircraft yawed to the left as the number two engine r.p.m. and torque dropped. The crew shut down the engine and continued the approach to a successful landing. Ground support personnel found that a large mallard drake had ducked into the intake of number two engine and damaged the front stages of the compressor section. Additional bird strikes were visible on the radome, battery compartment door, number one propeller, and the underside of the right outboard flap.

At low level, near the runway, and in visual conditions, machine and bird once again competed for the same airspace. As usual, it was a costly meeting for both fliers.

after deadline . . .

DRY ICE GAS -- The danger of confining dry ice in a close area was demonstrated not long ago when a crew, whose aircraft had dry ice aboard, entered unscheduled crew rest. The crew buttoned up their aircraft and headed for a hot shower and soft pillow, expecting to return the next day and take up where they had left off. Following crew rest, the crew returned to the aircraft and started their baggage drill again. That's when some of them started becoming lightheaded. The reason was that during the night the dry ice had sublimed and released carbon dioxide fumes in the unventilated cabin.

AFM 71-4 describes the properties and storage and handling procedures for dry ice. One of these is that aircraft commanders should always be briefed when cargo includes dry ice.

The real gripper in episodes such as this is that carbon dioxide concentrations exceeding nine percent can cause death.

SOF INVOLVEMENT -- A TDY SOF at an overseas base was monitoring the blockout of a C-141. During initial taxi-out, he noticed a ground wire dragging from the right main gear. He relayed the sighting to the aircraft commander through the operations center and ground control. The wire was removed after a temporary stop. Once again an extra set of eyes had helped prevent possible aircraft damage.

NEXT MONTH -- Feature articles will include:

* The South American Way -- A survey of facilities in South America reveals some interesting aspects of flying south of the border.

* Roger, No Joy -- What is one of the greatest hazards of stateside flying? If you think it's the possibility of mid-air collision in an environment of mixed IFR and VFR traffic, you're in tune with this fictitious story.

* Coffin Corner -- C-141s occasionally venture into this area. And it's not as high as you might think. This story tells why.

☆U.S. GOVERNMENT PRINTING OFFICE: 1975-665-150/7.

Touch and Go

WELL, THE D.O. SAID HE WAS GONNA CUT HIS THROAT IF WE DIDN'T BLOCK OUT ON TIME.